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10/731,602	12/09/2003	Paul J. Gyugyi	NVDA P000860	4738

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EXAMINER

MAGLO, EMMANUEL K

ART UNIT	PAPER NUMBER
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2619

MAIL DATE	DELIVERY MODE
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12/28/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/731,602

Applicant(s)

GYUGYI ET AL.

Examiner

Emmanuel Maglo

Art Unit

2619

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8 and 10-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8 and 10-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Response to Arguments

1. Applicant's arguments with respect to claims 1, 2, 4-8 and 10-14, 15, 16-21, 22, 23-30 have been considered but are moot in view of the new ground(s) of rejection necessitated by Applicant's amendment to claims 1, 2, 4-7, 10-12, 15, 17, 18, 20-23, 25, 26.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, 4-8 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikado et al. Pub # US 2003/0188013 A1, hereinafter referred to as Nishikado in view of Elzur et al. (US 6,629,125 B2) hereinafter referred to as Elzur.

Regarding claim 1, Nishikado discloses a *delegated connection table*, referred to as connection management table (Figs. 3 and 4 element 16) comprising:

initializing an entry (element 20 in Figs. 3 and Fig. 4, the connection management table 16, [0085], *with connection state corresponding to a connection selected by a transmission control protocol (TCP) stack for processing by an offload unit* (as in [0011] where the connection management processing unit monitors a connection state and manages the number of connections currently established -as in Fig. 4- to a server apparatus or to group of server apparatuses, Fig. 2 element 93 and as discussed in [0072] showing 93 as external or peripheral unit, representing an offload unit);

updating the entry when a first frame is received for the connection, ([0027] the priority token generation/update processing unit generates priority token information under certain conditions when failing to receive the priority token information from the client apparatus; whereas, the priority token generation/update processing unit updates or discards the priority token under certain conditions when receiving the priority token information from the client apparatus);

reading the entry when a second frame is transmitted for the connection, (as in [0074] where the communication mechanism 94 is connected to a communication line 97 under control of an instruction from the information processing program 100 to transmit data to another information processing device or communication device or conversely to receive data from the other information processing device or communication device and store it in the memory 92).

Nishikado teaches the claimed invention except *parsing the first frame to extract TCP payload data and uploading the TCP payload data to a memory*. In the same field of endeavor, Elzur teaches storing into memory after parsing the header of the frame, in order to extract TCP payload data. With reference to Fig. 7, the network controller 52 may copy the data portion of the packet directly into the appropriate buffer 304 (Col. 5 lines 29-33). Further, the beginning and end of the first frame header may be identified (block 504). The first frame header may be stored in the header memory 116 (block 506). For, FIGS. 9 and 10 are flow diagrams illustrating parsing of packet data by a receive parser 98 of the network controller of FIG. 5.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a packet parser as taught by Elzur to extract the network protocol being used by receive parser 98 in order to reduce consumption of bus resources.

Regarding claim 2, Nishikado teaches *updating the entry 20* when a second frame is transmitted. In server apparatus 2 when receiving request 50, (see Fig. 17) element 1080 transmits response after execution of the request triggering update of the entry 20 to some value associated with frame transmitted to destination dst2 as shown in the connection management table 16, Fig. 4. Nishikado teaches *copying portion of the second frame into a portion of the entry in the table* by triggering the privilege mapping processing unit 15, (Fig. 16), to set the process privilege depending on the client address (Fig. 12), or the destination address (Fig. 13). As result, (Fig 16) still, the

request queuing processing unit 14 selects the entry 20 [0157], [0158], extracted as a new selected entry.

Regarding claim 4, and as applied to claim 1 above, *Nishikado teaches uploading payload data to a location specified in the entry within a memory space of the memory that is allocated to an application program.* With reference to Fig. 2, Nishikado discloses the memory space 92, operatively connected to the information processing program 100. The memory 92 also stores, in addition to the information processing program 100, various types of data to be referred to by the information processing program.

Regarding claim 5, Nishikado teaches *notifying the TCP stack when the TCP payload data of the first frame received is updated by the offloaded unit to at least one of the legacy buffer* in that [0073] the external storage mechanism 93 holds the information processing program 100 and various sorts of data in a non-volatile form. The information processing program 100 to be run on the processing unit 91 instructs the external storage mechanism 93 to load a necessary programs or data into the memory 92 or conversely to store the program or data on the memory 92 into the external storage mechanism 93, a legacy buffer. Or the program may be previously stored in the external storage mechanism 93. Or the program may be introduced as necessary from an external device via a portable storage medium or a communication medium.

Regarding claim 6, Nishikado teaches *uploading to a legacy buffer the TCP payload when the TCP payload data of the first frame that is in the portion of the*

memory that is allocated to the driver configured to interface between the offload unit and an application program. With reference to Fig. 2, memory space 92 is operatively connected to the information processing program 100. Memory 92 also stores, in addition to the information processing program 100, various types of data to be referred to by the information processing program, for [0073] the information processing program 100 to be run on the processing unit 91 instructs the external storage mechanism 93 to load a necessary programs or data into the memory 92 or conversely to store the program or data on the memory 92 into the external storage mechanism 93. Or the program may be previously stored in the external storage mechanism 93.

Regarding claim 7, Nishikado teaches receiving a *third frame that does not correspond to another entry in the delegated connection table*. With reference to Fig. 4 and [0080] and [0081] a third entry received in the connection management table does not correspond to any other entry. Nishikado teaches further teaches uploading to a legacy buffer the TCP payload when the TCP payload data of the first frame that is in the portion of the memory that is allocated to the driver configured to interface between the offload unit and an application program.

Regarding claim 8, and as applied to claim 6 above, Nishikado discloses the claimed invention where a sequence number in the first frame does not correspond to a sequence number stored in the delegated connection table. As it can be seen in Fig. 10, another structure of the connection management table 16 is presented in addition to the example of FIG. 4, showing an applicable privilege information field 201 and an internal precedence information field 202 added to each entry 20; the later indicative of a

selection sequence between entries in the delegated connection table, so that [0148] the request queuing processing unit 14 extracts the connection management table entries 20 from the connection management table 16 sequentially one after another. Accordingly, [0150] the request queuing processing unit 14 examines whether or not the destination shown in the destination information 51 of the request is included in the destination shown in the destination field 21 of the extracted entry 20.

Regarding claim 10, Nishikado teaches *uploading the payload data of the first frame to at least one legacy buffer that is in a first portion of the memory that is allocated to a driver configured to interface between the offload unit and an application program when a user buffer in a second portion of the memory that is allocated to the application program is not available*. For [0073], the information processing program 100 to be run on the processing unit 91 instructs the external storage mechanism 93 to load a necessary programs or data into the memory 92 or conversely to store the program or data on the memory 92 into the external storage mechanism 93. Or the program may be previously stored in the external storage mechanism 93.

Regarding claim 11, Nishikado discloses the claimed invention *further comprising notifying the application program to complete processing of the first frame by having*, [0205], the data communication forwarding apparatus 3 terminates various operations of the processes 1014 to 1018 including disconnection to terminate the processing of the request from the client apparatus 1 (process 1086), Fig. 17.

Regarding claim 12, 13, and 14, Nishikado teaches *uploading any subsequent frames received for the connection, to one or more additional legacy buffers until*

resynchronization is signaled by the TCP stack, where resynchronization is accomplished by observing ACK numbers generated by the TCP stack, and where the ACK number is in a frame transmitted for the connection, and is more advanced than a sequence number stored in the entry, and is copied to the sequence number portion of the entry. Subsequent or next requests [0148] and [0149] are processed by the request queuing processing unit 14, where the unit extracts the connection management table entries 20 (comprising destination, dstn1-dstN, shown in the destination field 21) from the connection management table 16 sequentially one after another (process 1062), then [0150] examines whether or not the destination shown in the destination information 51 of the request is included in the destination shown in the destination field 21 of the extracted entry 20 (process 1064). The frame transmitted subsequent to processing unit 14 selection of 20 extracted in the process 1062 as a new selected entry indicates that number in the destination information 51 is more advance than the sequence number stored in the destination field of entry 20 of the connection management table.

Regarding claims 15 and 16, Nishikado discloses the claimed invention where the mapping processing unit 15 [0166] is used for *reading a connection match portion of the delegated connection table*. This is done using the privilege mapping processing unit 15 [0166] for using the address/process privilege conversion table 11 to find the matching portion of the connection table. The benefit is to determine that the received frame correspond to an entry in the connection match portion of the table where the privilege mapping processing unit 15 finds an entry for which the user's authentication

information field 121 matches the user's authentication information 52 using the user/process privilege conversion table 120, and finds the process privilege 59 using the value of the process privilege field 122 of the same entry. Accordingly the data received in the connection data portion in the table is parsed in the way that [0179] removes the priority token information 53, [...], and transmits only a request containing the information. Nishikado does not teach an expected sequence number, an acknowledgment (ACK) number, timestamp data, and a count of unACKnowledged frames in the entry. Elzur teaches, Fig. 3 an illustration of a connection data portion comprising sequence number 34, acknowledgment (ACK) number 36, and two others 42. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the two others 42 as taught by Elzur as timestamp data and count of unACKnowledged frames. The benefit is that such frames will be used to concatenate received packets associated with the flow.

Regarding claim 17, 18, and 19, Nishikado teaches

reading a connection buffer portion of the delegated connection table to obtain user buffer information including a user buffer address and a corresponding user buffer length of a user buffer that is stored in a portion of memory allocated to an application program, and

requesting user buffer 93 when the user buffer information indicates the user buffer requesting a user buffer by setting a request buffer flag in the connection buffer portion of the delegated connection table.

Nishikado does not teach *buffer*. Elzur teaches, (Fig. 3) the TCP protocol header 22a may include a field 38 that indicates a length of the header 22a, a field 44 that indicates a checksum for the bytes in the header 22a and a field 40 that indicates control and status flags. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the flag as taught by Elzur to set the length of the buffer to be used to concatenate received packets associated with the flow.

Regarding claims 20, and 21, Nishikado teaches *uploading the payload data to a legacy buffer that is in a portion of the memory that is allocated to a driver configured to interface between the application program and an offload unit including the delegated connection table*, as discussed previously where preferential processing of a service request can be realized according to the attribute of a user [007]. Nishikado again teaches the claimed invention by determining that a receive buffer has reached a high water mark [0081] when the maximum queuing number field 25 holds the maximum number of requests capable of being queued for the destination of the management object, and the buffer request timer has expired when the maximum wait time field 26 holds a maximum value of an overtaking wait time overtaken by a priority request later arrived.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 22-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikado in view of Elzur and further in view of Craft et al. Pub #US 20020091844 A1, herein and after referred to as Craft.

Regarding claims 22 and 23, Nishikado teaches the claimed invention except that the storage unit 93, (Fig. 2), is not divided into the first, the second or the third storage units configured to store respectively user buffer information, delegated connection state information or delegated connection identification information, but where [0073] the external storage mechanism 93 holds the information processing program 100 and various data in a non-volatile form. a user buffer length and a user buffer address corresponding to a portion of memory that is allocated to an application program; and a second storage resource configured to store delegated connection state information for the delegated connections including an acknowledgment (ACK) number, timestamp data, frames expected sequence number, an and a count of unACKnowledged.

In the same field of endeavor, Craft discloses storage buffer 70 where data could be stored according to user's attributes or the like. And, [0072] (Fig. 7), a first storage unit 462 is connected to first Ethernet-SCSI adapter 452 by a first SCSI cable 458. Similarly,

a second storage unit 464 is connected to second Ethernet-SCSI adapter 454 by a second SCSI cable 459, and a third storage unit 466 is connected to second Ethernet-SCSI adapter 456 by a third SCSI cable 460. Respective adapters 452, 454 and 456 according to SCSI standards operate the storage units 462, 464, and 466. Each storage unit may contain multiple disk drives daisy chained to their respective adapter.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a receive sequencer 2105, including the data synchronization buffer 2200, (Figs. 24 and 25), in connection with the receipt onto INIC 22 of the TCP/IP packets to match portion of the delegated connection associated with data stored in various storages 70 where connection state information stored in the connection data portion of said table is invoked by using buffer information to read connection buffer of said table in order to avoid flushing a connection as connection occurs, but to validate payload data by outputting, [0143], "data valid" signal upon matching of delegated connection information. The matching will enable the packet synchronization sequencer 2201 to instruct the data synchronization buffer 2200 to load the received byte from data lines 2215, therefore avoiding data flushing.

Regarding claims 24, 25 and 26, Nishikado teaches the claimed invention except a command processing unit configured to write to the first storage resource, or *transmit engine configured to access the second storage resource and parse incoming frames and determine whether or not the incoming frame are valid*, or a receive engine configured to access the second storage resource.

In the same field of endeavor, Craft discloses storage buffer 70 where data could be stored according to user's attributes or the like. And, [0072] (Fig. 7), a first storage unit 462 is connected to first Ethernet-SCSI adapter 452 by a first SCSI cable 458. Similarly, a second storage unit 464 is connected to second Ethernet-SCSI adapter 454 by a second SCSI cable 459, and a third storage unit 466 is connected to second Ethernet-SCSI adapter 456 by a third SCSI cable 460. Respective adapters 452, 454 and 456 according to SCSI standards operate the storage units 462, 464, and 466. Each storage unit may contain multiple disk drives daisy chained to their respective adapter.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the external storage mechanism to holds the information processing program 100 and various data in a non-volatile form. The INIC storage unit 70, [0050] such as a disk drive or collection of disk drives and corresponding controller, is coupled to the INIC bus 48 via a matching interface controller, INIC I/O controller 72, which in turn is connected by a parallel data channel 75 to the INIC storage unit.

The motivation is that because control information for fast-path data does not travel repeatedly over the host memory bus to be temporarily stored and then processed one layer at a time by the host processor, the host may thus be liberated from involvement with a vast majority of data traffic for file reads or writes on host-controlled storage.

Regarding claims 27, and 28, and as applied to claim 26 above, Nishikado teaches the claimed invention except a command processing unit configured to write to the first storage resource, or transmit engine configured to access the second storage resource, or a receive engine configured to access the second storage resource.

In the same field of endeavor, Craft discloses storage buffer 70 where data could be stored according to user's attributes or the like. And, [0072] (Fig. 7), a first storage unit 462 is connected to first Ethernet-SCSI adapter 452 by a first SCSI cable 458. Similarly, a second storage unit 464 is connected to second Ethernet-SCSI adapter 454 by a second SCSI cable 459, and a third storage unit 466 is connected to second Ethernet-SCSI adapter 456 by a third SCSI cable 460. Respective adapters 452, 454 and 456 according to SCSI standards operate the storage units 462, 464, and 466. Each storage unit may contain multiple disk drives daisy chained to their respective adapter.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to configure the processor 480 via INIC 400 to read the first storage 462 and the third storage 466 used in the external storage mechanism to holds the information processing program 100 and various data in a non-volatile form.

The motivation is that access to the first and the third storage via respective adapters 452 and 456 are likely to alleviate host processing as in [0074] where connection setup may in this case be handled by adapter 452, for example, by INIC 400 sending an initial packet to adapter 452 during a connection initialization dialog, with the packet processed by sequencers 475 and then sent to processor 480 to create a CCB. Certain conditions that require slow-path processing by a CPU running a software protocol stack are likely to be even less frequent in this environment of communication between adapter 452 and INIC 400. The messages that are sent between adapter 452 and INIC 400 may be structured in accordance with a single or restricted set of protocol layers, such as SCSI/TCP and simple network management protocol (SNMP), and are sent to or from a single source to

a single or limited number of destinations. Reduction of many of the variables that cause complications in conventional communications networks affords increased use of fast-path processing, reducing the need at adapter 452 for error processing. Adapter 452 may have the capability to process several types of storage protocols over IP and TCP, for the case in which the adapter 452 may be connected to a host that uses one of those protocols for network storage, instead of being connected to INIC 400. For the situation in which network 450 is not a SAN dedicated to storage transfers but also handles communication traffic, an INIC connected to a host having a CPU running a protocol stack for slow-path packets may be employed instead of adapter 452.

Regarding claims 29 and 30 see claims 15 and 16 above.

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

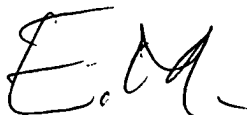
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

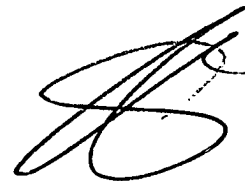
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Maglo whose telephone number is (571)270-1854. The examiner can normally be reached on Monday - Friday 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571)272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Emmanuel Maglo
Patent Examiner
December 19, 2007



STEVEN NGUYEN
PRIMARY EXAMINER